

Notice of Allowability

Application No.

10/661,221

Examiner

Joseph W. Drodge

Applicant(s)

BAGGOTT ET AL.

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1723

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to the Amendment of July 5, 2007 and Interview Summary of August 3, 2007.
2. ☒ The allowed claim(s) is/are 1 and 3-34, now renumbered claims 1-33.
3. ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 - a) ☐ All b) ☐ Some* c) ☐ None of the:
 1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

* Certified copies not received: _____.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.

THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.

4. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.
5. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
 - (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached
 - 1) ☐ hereto or 2) ☐ to Paper No./Mail Date _____.
 - (b) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date _____.

Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).
6. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

1. ☒ Notice of References Cited (PTO-892)
2. ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3. ☐ Information Disclosure Statements (PTO/SB/08),
Paper No./Mail Date _____
4. ☐ Examiner's Comment Regarding Requirement for Deposit
of Biological Material
5. ☐ Notice of Informal Patent Application
6. ☒ Interview Summary (PTO-413),
Paper No./Mail Date 20070809.
7. ☒ Examiner's Amendment/Comment
8. ☒ Examiner's Statement of Reasons for Allowance
9. ☐ Other _____.

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An examiner's amendment to the record appears below. Should the changes and/or additions be unacceptable to applicant, an amendment may be filed as provided by 37 CFR 1.312. To ensure consideration of such an amendment, it MUST be submitted no later than the payment of the issue fee.

Claim 1 has been amended as follows: --

1. (Currently Amended) A method of removing contaminants from water comprising the steps of:

(a) providing a water feed directly downstream of and in-line with process water exposed to hydrocarbon and/or chemical processing by hydrocarbon or chemical processing equipment, wherein said water feed contains [a large proportion of] contaminants [to water], the contaminants including one or more of nitrogen-containing compounds, carbonate, hydrogen sulfide, selenium, other sulfur acids and organic acids resultant from said processing equipment;

(b) providing a reverse osmosis system in-line with said water feed, said reverse osmosis system capable of withstanding desired process parameters in water feed temperatures up to 185° F and being directly connected to said water feed, said reverse osmosis system comprising an inlet, at least one reverse osmosis membrane, a permeate outlet, and a reject outlet;

(c) applying pressure or adjusting pressure of said water feed to a

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degree sufficient to force said water feed through said reverse osmosis system and to effect a reverse osmosis process comprising separating said water feed into permeate and reject which includes at least one of said contaminants;

(d) directing said permeate to said permeate outlet; [and]

(e) directing said reject to said reject outlet; **and**

(f) providing a sour water stripper located upstream of said reverse osmosis system or located such that water treated by said sour water stripper is combined with said permeate from said reverse osmosis system.

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Claim 19 has been amended as follows:

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19. (Currently Amended) An apparatus for the removal of contaminants from process condensate comprising:

(a) a water feed conduit-supplying a water feed directly downstream of and in-line with process water exposed to hydrocarbon and/or chemical processing by hydrocarbon or chemical refining equipment, wherein the contaminants include [a large proportion of] hydro-carbon in the process condensate resultant from said processing equipment; [and]

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(b) a reverse osmosis system comprising an inlet, at least one reverse osmosis membrane, a permeate outlet, and a reject outlet, wherein said reverse osmosis system is capable of separating molecular species in water feed temperatures up to 185° F and is directly connected to said water feed;
and

(c) a sour water stripper located upstream of said reverse osmosis system or located such that water treated by said sour water stripper is combined with said permeate from said reverse osmosis system. --

Claim 24 has been amended as follows: --

24. (Currently Amended) A method for the removal of contaminants from water comprising the steps of:

(a) providing a water feed directly downstream of and in-line with process water exposed to hydrocarbon and/or chemical processing by hydrocarbon or chemical processing equipment, wherein said water feed contains [a large proportion of] contaminants [to water], the contaminants including one or more of nitrogen-containing compounds, carbonate, hydrogen sulfide, selenium, other sulfur acids and organic acids resultant from said processing equipment;

(b) providing a first reverse osmosis system in-line with said water feed, said first reverse osmosis system capable of withstanding desired process parameters of water temperatures up to 185° F and being directly connected to said water feed, said reverse osmosis system comprising a first inlet, at least one reverse osmosis membrane, a first permeate outlet, and a first reject outlet;

(c) applying pressure or adjusting pressure of said water feed to a degree sufficient to force said water feed through said first reverse osmosis system and to effect a reverse osmosis process comprising separating said water feed into a first permeate and a first reject which includes at least one of said contaminants;

(d) directing said first permeate to said first permeate outlet;

(e) directing said first reject to said first reject outlet;

(f) providing a second reverse osmosis system downstream of said first permeate outlet, said second reverse osmosis system comprising a second inlet, at least one reverse osmosis membrane, a second permeate outlet, and a second reject outlet, wherein said first permeate outlet feeds into said second inlet;

(g) adjusting the pH of said first permeate prior to introduction of said first permeate to said second reverse osmosis system; [and]

(h) applying pressure or adjusting pressure of said first permeate at said inlet of said second reverse osmosis system a degree sufficient to force said first permeate through said second reverse osmosis system to effect a second reverse osmosis process separating said first permeate into a second permeate and second reject which includes at least one of said contaminants; and

(i) providing a sour water stripper located upstream of said reverse osmosis systems or located such that water treated by said sour water stripper is combined with said permeate from said reverse osmosis systems.

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Claim 29 has been amended as follows:

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29. (Currently Amended) A method of removing contaminants from water through a multi-stage reverse osmosis process comprising the following steps:
(a) completing the following steps of stage one:

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(i) providing a water feed directly downstream of and in-line with process water exposed to hydrocarbon and/or chemical processing by hydrocarbon or chemical processing equipment, wherein said water feed contains [a large proportion of] contaminants [to water], the contaminants including one or more of nitrogen-containing compounds, carbonate, hydrogen sulfide, selenium, other sulfur acids and organic acids resultant from said processing equipment;

(ii) providing a stage one reverse osmosis system capable of separating molecular species in water temperatures up to 185° F and being directly in-line with said water feed, said stage one reverse osmosis system comprising a stage one inlet, at least one reverse osmosis membrane, a stage one permeate outlet, and a stage one reject outlet;

(iii) applying pressure or adjusting pressure of said water feed to a degree sufficient to force said water feed through said stage one reverse osmosis system and to effect a reverse osmosis process comprising separating said water feed into a stage one permeate and a stage one reject which includes at least one of said contaminants;

(iv) directing said stage one permeate to said stage one permeate outlet;
and

(v) directing said stage one reject to said reject one outlet; [and]
(b) completing at least one additional reverse osmosis process wherein a reject

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from a previous step is introduced to a reverse osmosis system of an immediately following subsequent step; said additional reverse osmosis process comprising the following steps:

(i) providing a stage two reverse osmosis system downstream of said stage one reject outlet, said stage two reverse osmosis system comprising a stage two inlet, at least one reverse osmosis membrane, a stage two permeate outlet, and a stage two reject outlet; wherein said stage one reject outlet feeds into said stage two inlet;

(ii) applying pressure or adjusting pressure of said stage one reject at said inlet of said stage two reverse osmosis system to a degree sufficient to force said stage one reject through said stage two reverse osmosis system to effect a second reverse osmosis process separating said stage one reject into a stage two permeate and a stage two reject which includes at least one of said contaminants; and (c) combining said stage one permeate and said stage two permeate; and

(c) providing a sour water stripper located upstream of said reverse osmosis systems or located such that water treated by said sour water stripper is combined with said permeate from said reverse osmosis systems. --

Authorization for this examiner's amendment was given in a telephone interview with Darren Kang on August 7, 2007.

The following is an examiner's statement of reasons for allowance: Independent claims 1,19,24 and 29. The independent claims now respectively distinguish over the applied prior art of record and also over newly cited Perry patent 5,376,262; Breidenbach et al patent 4,495,031 and Overman patent 5,993,667 in view of the combination of limitations directed towards the reverse osmosis membrane(s) being operable to process feed water at temperatures up to 185 degrees F and there being a sour water stripper provided either upstream of the reverse osmosis system(s) or located such that water treated by the sour water stripper is combined with permeate from the reverse osmosis system(s).

Although the prior art teaches that water treatment systems having upstream sour water strippers in combination with downstream reverse osmosis systems are known, the reverse osmosis membranes used in such systems are not suggested as being adapted for high temperature operation , there being either means for cooling the feed water between stripper and reverse osmosis system or multiple water treatment or water storage units therebetween that would inherently cool the water.

Support for the limitations added by Examiners Amendment concerning combination of reverse osmosis membrane systems and sour water strippers are found at paragraphs 21-25 of the instant Specification.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

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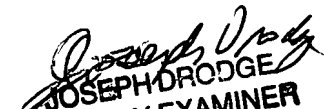
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JWD

August 9, 2007

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